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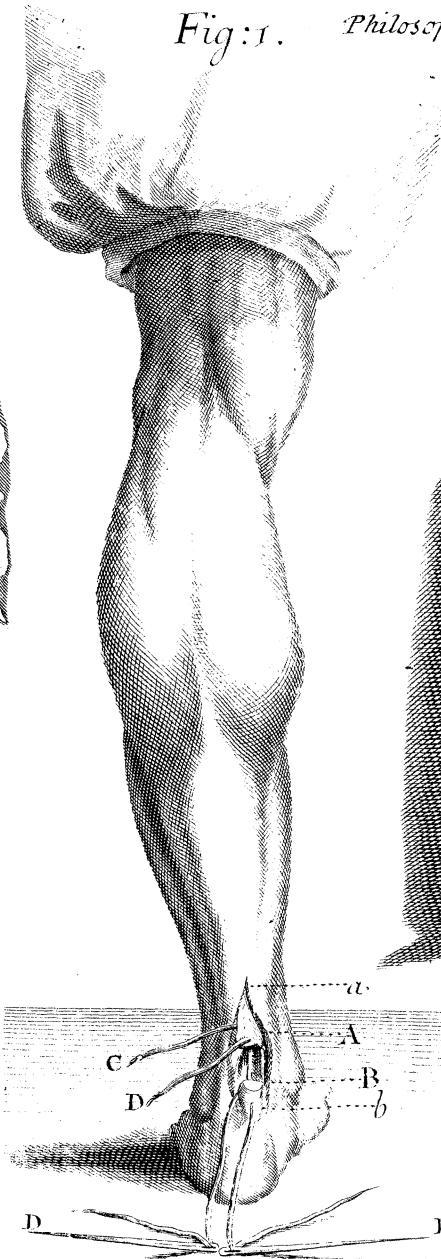
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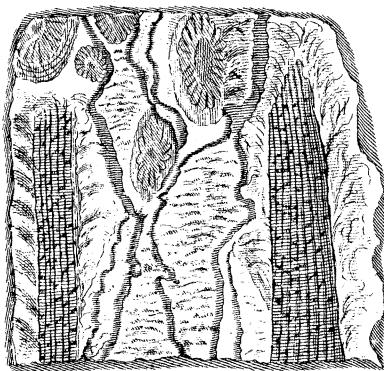
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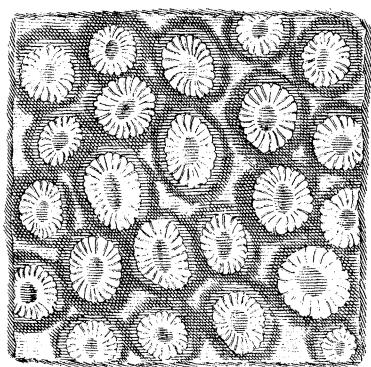
*Fig:1.* Philosoph: Transact N<sup>o</sup> 232.



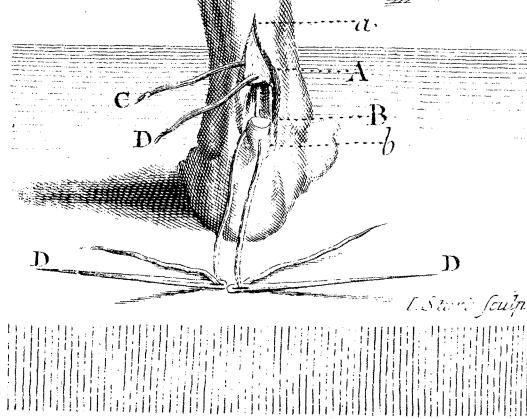
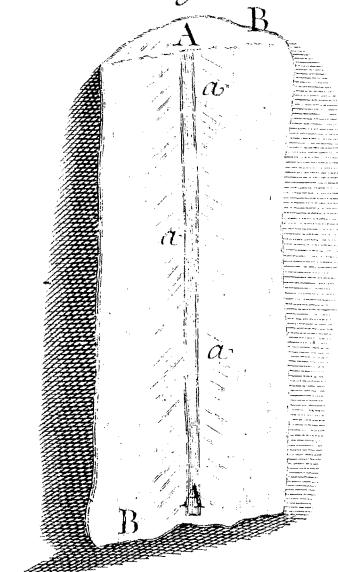
*Fig:III.*



*Fig:III.*



*Fig:2.*



**II An Account of Stitching the Great Tendon,  
between the Calf of the Leg and Heel, with  
its Union and Cure, after an entire Division  
of it, with Remarks : Read at a Meeting of  
the Royal Society. By Mr. William Cow-  
per, F.R.S.**

**O**N the First Day of *February* last I was called to *Thomas Wheatly*, a Carpenter, Aged Thirty Years, who had totally divided the Great Tendon of the *Musculi Gasterocnemii* of the Left Leg, about Three Fingers Breadth above the *Os Calcis*. I found the upper part of the Tendon withdrawn from the Inferior at least Two Inches. I not being provided with Needles large enough for the Operation I design'd, I was obliged to step home to fetch them; and in my return I called on Mr. *Goodiar*, an Experienced Surgeon, who was present, and assisted me in the following Operation.

The Applications being prepared, and Two or Three large Needles, with strong Silk in them well Waxed, I was first obliged to divide the external Teguments, *Fig. 1. a, b.* to come at the ends of the divided Tendon, *AB ib.* This done, the first Needle (*C*) I passed thorow the Body of the Tendon (*A*) about half an Inch above its divided Extremity. The second Needle (*D*) was thrust through this upper part of the Tendon, a little under the former, least the two Threads (or Silks) should meet each other at their decussation, in the middle of the Tendon. Afterwards both these Needles were passed thorow the lower part of the divided Tendon, as express'd in the last mentioned Figure *C. D.* The

Foot being held extended, the two ends of the Tendon were applied to each other, by the Assistance of the Ligatures (C. D.) which were so tyed, as to keep the divided parts close together, whilst the Foot remained in this Posture. After the four ends of these Ligatures were cut off I found it was necessary to bring the sides of the divided Skin nearer each other with one single Stitch, a little above the Suture of the Tendon. This done, a Pledget of Lint dipt in Balsam of Turpentine was laid on the Wounds, and another large Pledget of Flax, arm'd with *Linimentum è Gummi Elemi* over it. After the Application of common Bandages, Bolsters, &c. I found it was necessary to place a thick piece of Past-board, of a convenient Arched Figure, on the Fore-parts of the Foot and Leg, to keep the part Inflected, and prevent any motion of it, which might break out the Stitches in the Tendon. He complained very much in passing the Needles through the upper part of the divided Tendon ; tho' its middle and internal part at the division, was scarce sensible of the touch of my Finger. He had no pain in passing the Needles through the lower part of the Tendon. After Fourteen Ounces of Blood was taken from his Arm, I left him on his Bed. Six Hours after (which was about Eight at Night) I found his Pulse somewhat quicker then before : He then took an Ounce of *Syrup. de Meconio*. The next Morning I found him in no ill Condition: He told me he had got some Sleep that Night, but was often awakened with twitchings in the Calf of the Wounded Leg. The third day after the Operation, I dreit the Wound with the same Applications as before ; only using a Fomentation, made of a Decoction of Wormwood, Sage, Rosemary, Bay-Leaves, &c. On the fourth Day after the Operation, I found the Applications on the Wound very wet with a serous Humor, commonly called a Gleer.

On

On the Sixth Day the matter became somewhat thicker, and the Skin being a little distended about the Wound, I was obliged to divide the last mentioned Stitch, to admit of the free Discharge of the *Pus*, which on the two succeeding Days became much thicker than before, and the Gleet consequently lessened.

About this time the two ends of the Tendon were not a little dilated, and a white Slough appeared on it, towards the upper part of the Wound ; on which, instead of the Balsam of Turpentine, I applied Tincture of *Myrrh*. Not many Days after, this Slough came off, and the two ends of the Tendon were over-spread with a Fungous Flesh, by which I was assured, that its Blood Vessels and Nutritive Tubes, were not comprest by the two first Ligatures. Afterwards I made use of drier Applications than before ; sometimes using Lint only, and at other times *Pulvis Terebinthinae*. About Ten days After the Operation, I found one of two Ligatures in the Tendon hanging loose, which I divided and drew out. Two or three Days after, I found the other Ligature loose also, which in like manner I removed. The Part all this while being kept Inflected by the Past-board above mentioned.

I was often obliged to apply gentle *Escharoticks*, or lessen the *Fungus* on the Tendon. In less than Thir-ty Days after the Operation he went abroad very Lame-ly. And not many Days after, he told me he had walkt round St. James's Park ; nor did any ill Conse-quence follow, tho' he employed himself daily in some sitting Work of his Trade ; he still recovering more and more Use of his Foot ; insomuch, that on the 26th of March following (which was within Eight Weeks after the Operation) he walkt from his Habitation in Witch-street without *Temple bar*, to *Greenwich*, to see a large Whale that lay then on the Shore, and returned in a

few Hours. He has now recovered all the Motions of his Foot, and shews very little Lameness in Walking, and is not in the least incommoded in working at his Trade.

If it should be thought, I have been tedious in reciting so many particulars of this Case, it may be some excuse to have it known, that the Uncommonness of the Stitching of Tendons in general, and the Rarity of this Instance in particular, might make it necessary not to omit any Circumstance, since many Accurate Writers of the Operations of Surgery, either pass by this of Stitching of Tendons, or disapprove of it; and others describe the Practice of it, very different from what I have here Represented.

#### R E M A R K S.

Among all the Authors I have consulted on this Occasion, I can meet but with a single Instance of the like Case, which is barely mentioned by *Veslingius*, one of the most Accurate Anatomists of his time, who has express'd his great surprize at the Success.

It is a Common Opinion, That Stitching divided Tendons is hazardous, if not impracticable; nor has this Conjecture been without many Favourers of it among Chirurgical Writers; Tho' the Works of *Ambrose Parrey* justly exact our esteem (particularly for recommending that incomparable Practice of tying the ends of Arteries, after the Amputations of Limbs, to restrain the Flux of Blood; and strenuously asserting it against his peevish Adversary, \* *Bartholomaeus Perdulcius*; which Practice has been but lately revived among us with Success;) I say, notwithstanding this Author has so well deserved from Mankind, yet I ought not to pass by what he has said in his Tenth Book, Ch. 36. where he tells us, ‘ Some Surgeons have been so bold as to sow together the ends of the Tendons of the Ham and other Joyns, when they have been quite

\* Lib. 7.  
C. 8.

• Cut asunder. But I durst never Attempt it, *says he*,  
 • for fear of Pain, Convulsions, and the like horrid  
 • Symptoms. (*To this he adds*) For the Wounds of that  
 • large Tendon: which is composed of the Three Mus-  
 • cles of the Calf of the Leg, and goes to the Heel,  
 • I have observ'd when it hath been Cut with a Sword,  
 • that the Wounds have been long and hard to Cure;  
 • and besides, when at the last they have been healed;  
 • so soon as the Patient hath got out of his Bed, and en-  
 • deavoured to go, they have grown ill, and broke  
 • open again.

I had once an opportunity of observing the like in a Wound of this Tendon, which nevertheless ought not to discourage Surgeons from Stitching it, when it is entirely divided, as the preceding Instance will Evinde.

*Hippocrates* seems to favour the Opinion, That De Morb.  
L. I. m.  
pag. 450. Nerves or Tendons would not grow together when entirely divided; nor does he anywhere (that I can find) speak of Stitching them.

Tho' *Galen* does not propose the suture of divided Tendons, yet \* *Guido* pretends he tacitly Acknowledges \* Tract. 3.  
Doct. 1.  
Cap. 4.  
† Meth.  
med.C.3. that Practice, in saying, † *They are Cured as other Ulcers* and *Wounds are*, i.e. *Guido* adds, *Quod alia Ulcerâ suuntur, ut serventar partes adductæ.*

*Avicen* says, *Si autem disrumpatur in latitudine Nervus tunc necessarium est suere ipsum, & si non, non conglutinatur.* The like Opinion with *Avicen* is *Gul. e Salice*. Fen. 4. T.  
4. Cap. 2. to Lib. 2. C. 9. *Rogerius*, L. 3. C. 13. *Lanfrancus*, L. 2. C. 9. Doct. 3. C. 3. & in *Chirurgia parva*, C. 4. *Nicolaus Florentinus* speaks of the Suture of Tendons, and so does *Brunus*, L. 1. C. 5.

*Guido* Contends for this Operation, and Answers the Objections those make, who say these parts will not grow together again by the first Intention, and must therefore be supplied with a Foreign Substance, which will

will break the continuity of the Pores, and obstruct the Passages of the Spirits. *Vidi* (says he) & *audivi in multis Nervos & Tendines incisos, & eos ita restauratos Sutura, & aliis auxiliis, ut postea incredibile videretur ipsos fuisse incisos.*

*Macius Aurelius Severinus* also pleads for stitching of Tendons: Here I must not omit taking notice of a Misrepresentation this Author makes in citing a Passage from *Ambrose Parey*, where he only acquaints us of a Tin-cafe, or Thumb-stall he caused to be made, to keep the Thumb Erect; after its extending Tendons were compleatly divided; Nor does *Parey* say, those Tendons were afterwards joyned together again, as *Severinus* represents. *Petrus de Marchettis*, Obs.LXIII. takes Notice of this Mistake of *Severinus*, and Censures him for promoting this Practice of Stitching of Tendons.

*Felix Wurtz* assures us from his own Experience, and the Practice of Others, that Tendons totally divided will unite again, by stitching them together.

Epist.xv. The Learned and Ingenuous *Joannes Veslingius*, in an Epistle to *Fabricius Hildanus* (where he cites divers Inconsistencies out of *Galen*, concerning Wounds of the Tendons) produces an Instance not unlike this I have related, *Vidi* (says he) *in parentis mei amanuense Ortho Lofero Tendinem à Gasterocnemio & Soleo Musculis conflatum, paulo supra Calcis os dissectum, suturis aliquot à Chirurgis conjunctum.* (To this he adds) *In Grabe item cui acinace Tendo à Tibiae Extensoribus constitutus transversim sub Patellâ genu Vulneratus, similem in modum à Tunitario Chirurgo adducebatur: Detestabar hominum audaciam, sed felix successus & vix notabile à peracta curatione detrimentum, timoris mei vanitatem arguebant.*

*Mon. Brenaise*, is said to be the Reviver of the Practice of Stitching divided Tendons. The † *Miscellanea Curiosa*, and *Mon. Verduc*, give us differing Accounts of his way of operating; the manner mentioned by the First seems not Practicable; nor is *Verduc's* without Perplexity, and scarce intelligible.

*Mon. Vauguion* in his Chirurgical Operations (lately Published in English) follows the Account Mons. *Verduc* has given of Mons. *Brenaise's* manner; in which they both agree, that one end of the divided Tendon must be drawn over the other, which could not have been done in the present Instance; nor do I believe it is necessary in other Cases; or that so many Compresses they speak of, should be useful in the Sutures of Tendons; concerning which their Writings may be consulted.

Besides these, there are other Writers of Chirurgical Operations in French, who pretend to give an Account of the manner of Stitching of Tendons, and seem to acquiesce in M. *Brenaise's* Method.

*Nuck* in his Chirurgical Operations, describes this amongst the rest, in these words: 'Thus I pass (*says he*) a strong Waxed Thread through the extremities of the divided Tendon. This done, by the Assistance of a Compress of Cork or Leather, the ends of the Tendon may be drawn to each other, and the Ligature will be firmer; nor can there be such Hazard of the Laceration of their ends, as in tying them without a Compress; he not saying any thing of either end of the Tendon being brought over the other.'

Tho' the Authority of so many Writers would have prevail'd with me in some measure, to have an Opinion of the Success of such an Attempt; yet the Contradictions of Others, of no less Note, would have left me dubious,

dubious, had I not some time since seen large Blood-Vessels in the Tendon of a Horse's Leg ; which at that time Convinced me, that Tendons, as well as Bones, and other Parts, would Unite, tho' they were quite divided, in case the Neighbouring Parts remain entire ; if their two Extreams could be Artificially applied to each other, without Compressing all or the greatest part of their Blood-Vessels. This distribution of the Blood-Vessels, is express'd in the annex'd Figure 2. where one Trunk (*A A*) with its Branches (*a a*) to the *Fibrilla* of the Tendon (*B B*) is express'd : whether it was a Vein or an Artery, I could not discover in that Subject, but in all probability, both those Vessels have the like Disposition in such large Tendons. I am inclined to think the like Distribution of Blood-Vessels is not to be found in the Tendon, which was divided in this present Instance ; but that its Blood-Vessels pass into it and back again at its internal side, next the Muscles of the Toes and *Tarsus* ; which ought to be taken Notice of by the Operator in the like Case, and that he does not free it of its Fat and Membranes next those Muscles, least its Communication with the Blood-Vessels be destroyed.